

INDUSTRIAL AND SYSTEMS ENGINEERING

SPRING NEWSLETTER 2024

Federico
Battista



Xin
Jiang



Tommaso
Giovannelli



Nimita
Shinde



Courtney
Paquette



Albert
Berahas



Mike
O'Neill



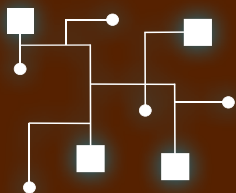
Gülçin
Dinç Yalçın



Mengqi
Hu



Postdocs at Lehigh ISE, a tradition of excellence!



LEHIGH
UNIVERSITY

P.C. Rossin College
of Engineering and
Applied Science



INSIDE THIS ISSUE

PAGE

Chair’s Message..... 3

ISE Programs..... 4

ISE Faculty News 8

ISE Lecture Series 13

Rossin and ISE Awards..... 16

Degrees Awarded..... 19

ISE Student News.....20

ISE Alumni News.....22

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READER FEEDBACK:

Please send comments to the editor,
Sheila Dorney at
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Dear Lehigh ISE Community,



As we catch our breath from a very productive spring semester, I would like to reflect on the many accomplishments of our faculty, students, postdocs, alumni, and staff, and give thanks

and recognition to Lehigh ISE for finishing the 2023-2024 academic year strong!

Our faculty continues to be recognized for their outstanding accomplishments in their professional career and service to industrial and systems engineering.

I am thrilled to share that Lehigh ISE Professor and Deputy Provost for Faculty Affairs, **Larry Snyder** was elected as a Fellow of the Institute of Industrial and Systems Engineers (IISE). A fellow is the highest classification of the IISE membership. Professor **Snyder** has also constructed a crossword puzzle that was published in the New York Times.

Professor **Tamás Terlaky** was honored to deliver prestigious plenary lectures in Asia and the US. He also delivered the Spring 2024 Class of '27 endowed lecture at Rensselaer Polytechnic Institute (RPI). Professor **Terlaky** was also appointed as the Alcoa Foundation Professor of Industrial and Systems Engineering, in recognition of his accomplishment and contributions to the Lehigh Engineering community.

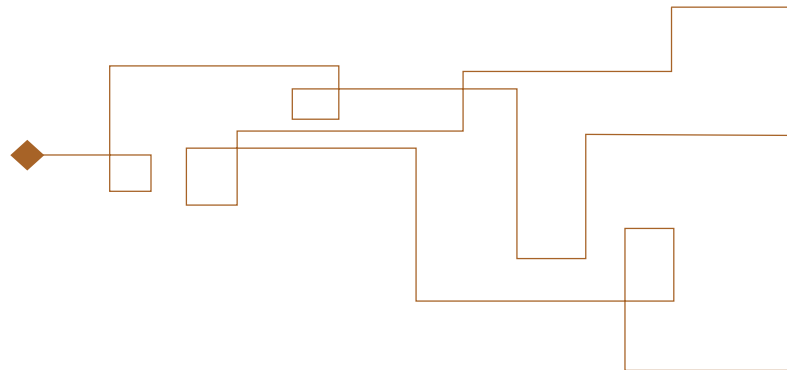
It was a true honor for me to be selected as a Fellow of the Society for Industrial and Applied Mathematics (SIAM). The SIAM Fellows Program recognizes members of SIAM who have made outstanding contributions to fields served by the industrial and applied math community. I am also excited to share that I was elected president of the Association of Chairs of Operations Research Departments (ACORD) for a 2-year term. It is a great honor and responsibility to lead ACCORD during the next two years.

In addition to our outstanding faculty, we have been fortunate to attract highly talented postdoctoral researchers at Lehigh ISE. Inside this newsletter, you see how they have significantly contributed to expanding our research capacity, and making a positive impact in the department through teaching and organizing events.

We look forward to our Spencer C. Schantz Distinguished Lectures hosted each Spring. On April 11 we welcomed **Robert M. Freund**, MIT Sloan School of Management. **Christine Burke** was the recipient of the 2024 ISE Distinguished Alumni Award, and we were honored to have her deliver the Spring ISE Spencer C. Schantz Distinguished public lecture on May 2. An afternoon of celebration continued at the 2024 ISE Award Ceremony and 2024 ISE Banquet. The full list of awardees is inside.

I am extremely delighted to announce that Professor **Robert H. Storer** has won the 2024 Lehigh University Rossin Citizenship Award. This award recognizes a Rossin college faculty member who has demonstrated outstanding citizenship to Lehigh University, the Rossin College, and their own Department/Unit.

I invite you to read our Spring 2024 Newsletter to learn more about all these great achievements and find out who has graduated and excelled as alumni. I wish you all a productive and pleasant summer.





**LEHIGH ISE
IS CELEBRATING 100 YEARS**

Please join us in celebrating Lehigh ISE 100!

In the academic year **2024/2025** we will accomplish 100 years of Industrial Engineering at Lehigh. Yes, we started offering our first undergraduate program in Industrial Engineering a century ago!

Please join us celebrating Lehigh ISE 100!

We are making available a number of great sponsoring opportunities for the many events offered on the occasion of Lehigh ISE 100. These opportunities are open to all, from members of the Lehigh ISE community (including alumni and parents of students) to industry companies interested in promoting Lehigh ISE.

You can build your name and brand awareness in our community and partnering companies, explore great networking opportunities, and associate your name with Lehigh ISE 100 in perpetuity.

Lehigh's Industrial and Systems Engineering (ISE) Department has a world-renowned reputation of research excellence and is continually innovating in all educational, outreach, and industrial programs. We thrive as a diverse and inclusive community and provide an inspiring environment to study and discover. Our extremely successful alumni form a supportive ecosystem for extensive professional networking opportunities. Our highly ranked programs include data analytics, healthcare systems, financial engineering, and management science.

Lehigh ISE 100 Program Events:

- Lehigh ISE Alumni Lectures, 2024
- Lehigh ISE Alumni Lectures, 2025
- Lehigh ISE Annual Banquet, 2024
- Lehigh ISE Annual Banquet, 2025
- Lehigh ISE Awards Ceremony, 2024
- Lehigh ISE Awards Ceremony, 2025
- Lehigh ISE Career Fair, 2024
- Lehigh ISE Career Fair, 2025
- Lehigh ISE First Year Student, 2024
- Lehigh ISE First Year Student, 2025
- Lehigh ISE Graduation Party, 2024
- Lehigh ISE Graduation Party, 2025
- Lehigh ISE Seminar Series, 2024
- Lehigh ISE Seminar Series, 2025
- Lehigh ISE Student Alumni Mixer, 2024
- Lehigh ISE Student Alumni Mixer, 2025
- Lehigh ISE UG and Master's Student Research Symposium, 2024
- Lehigh ISE UG and Master's Student Research Symposium, 2025
- Women at ISE, 2024
- Women at ISE, 2025
- Modeling and Optimization: Theory and Applications (MOPTA) Conference (the Lehigh ISE flagship conference), Summer 2024
- Modeling and Optimization: Theory and Applications (MOPTA) Conference (the Lehigh ISE flagship conference), Summer 2025

DIAMOND LEVEL

\$50,000.00 (single opportunity)

- Naming of the whole Lehigh ISE 100 Program
- Verbal/slide recognition at the opening session of all Events
- One-time email use to address the entire Lehigh ISE alumni community
- 125-word listing online
- Recognition on website, signage, and print of all events
- Recognition on website of the Lehigh ISE 100 Program (size proportional to sponsorship level)
- Name engraved on a plaque "Lehigh ISE 100" to be posted at Mohler 1st Floor Lounge (font size proportional to sponsorship level)

PLATINUM LEVEL

\$25,000.00 (single opportunity)

- Naming of the Mobile App Lehigh ISE 100 Program
- Naming of 3 Events and verbal/slide recognition at the opening session of the 3 Events
- 100-word listing online
- Recognition on website, signage, and print of 3 Events
- Recognition on website of the Lehigh ISE 100 Program (size proportional to sponsorship level)
- Name engraved on a plaque "Lehigh ISE 100" to be posted at Mohler 1st Floor Lounge (font size proportional to sponsorship level)

GOLD LEVEL

\$10,000.00

- Naming of one Event and verbal/slide recognition at the opening session of the Event
- Co-sponsorship of the Lehigh ISE social media platforms for 2 years (Facebook, LinkedIn, twitter, Instagram)
- 75-word listing online
- Recognition on website, signage, and print of the Event
- Recognition on website of the Lehigh ISE 100 Program (size proportional to sponsorship level)
- Name engraved on a plaque "Lehigh ISE 100" to be posted at Mohler 1st Floor Lounge (font size proportional to sponsorship level)

SILVER LEVEL

\$2,500.00

- 50-word listing online
- ISE Newsletter front cover co-sponsoring (3 numbers)
- Recognition on website of the Lehigh ISE 100 Program (size proportional to sponsorship level)
- Name engraved on a plaque "Lehigh ISE 100" to be posted at Mohler 1st Floor Lounge (font size proportional to sponsorship level)

BRONZE LEVEL

\$1,000.00

- ISE Newsletter back cover co-sponsoring (3 numbers)
- Recognition on website of the Lehigh ISE 100 Program (size proportional to sponsorship level)
- Name engraved on a plaque "Lehigh ISE 100" to be posted at Mohler 1st Floor Lounge (font size proportional to sponsorship level)

Please contact directly Lehigh ISE Department Chair, Professor Luis Nunes Vicente (ise@lehigh.edu).

Luis will first address questions about the sponsorship opportunities, and then:

- (1) Call Lehigh's Office of Development and Alumni Relations (DAR) to acknowledge your sponsorship;
- (2) Together with DAR, provide you the means to process your sponsorship;
- (3) Develop at ISE your chosen sponsorship according to the chosen level.

POSTDOCS AT LEHIGH ISE, A TRADITION OF EXCELLENCE

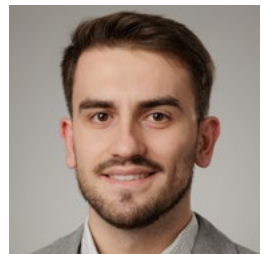
At Lehigh ISE, a vibrant community of talented postdoctoral researchers, commonly referred to as postdocs, has been expanding our research capacity, adding dynamism and diversity to our academic environment. Many PhD graduates opt for a postdoc position before starting their independent careers to develop more research and gain experience. They are typically advised by local faculty members and become

important members of their research groups, accelerating PhD theses and writing research grant proposals. They also contribute to the department enterprise doing things like teaching a course or organizing an event. Lehigh ISE postdocs have thus played an important role over the past 10 years, and this article pays them a very deserved tribute.

Lehigh ISE currently has four postdocs.



Federico Battista joined our department in February 2023 and works with Prof. Ted Ralphs in the area of mixed-integer optimization, developing theoretical and computational methodologies. Federico's research interests aim to design and implement strong relaxations and efficient Branch-and-Cut frameworks for mixed-integer bilevel linear problems.



Tommaso Giovannelli, who will join the University of Cincinnati as an assistant professor in August 2024, started his postdoc at Lehigh ISE in June 2021 after spending more than one year as a visiting scholar. Tommaso works with Prof. Luis Nunes Vicente on stochastic algorithms for bilevel and multi-objective problems for optimization and machine learning. Tommaso is also the chair of the 2023 and 2024 editions of MOPTA, the Lehigh ISE flagship conference.



Xin Jiang affiliated with the Program in the Foundations and Applications of Mathematical Optimization and Data Science, has been a postdoc at Lehigh ISE since August 2022. Xin's research interests include semidefinite programming and efficient and scalable optimization algorithms for various applications from engineering, machine learning, and data science.



Nimita Shinde joined Lehigh ISE in June 2023 after serving as a postdoctoral fellow at Brown University. Nimita works with Prof. Daniel P. Robinson on the development of theoretical guarantees for low-dimensional sparse subspace clustering problems and practical algorithms for hyperplane clustering.

POSTDOCS AT LEHIGH ISE, A TRADITION OF EXCELLENCE

We also want to celebrate the accomplishments of past postdocs.



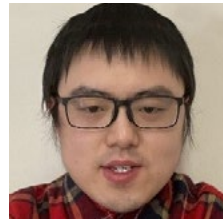
Courtney Paquette, currently an assistant professor at McGill University, Canada, was a postdoc at Lehigh ISE from January 2018 to July 2018 under the supervision of Prof. Katya Scheinberg. Courtney's research interests focus on designing and analyzing algorithms for large-scale optimization problems, motivated by applications in data science.



Gülçin Dinç Yalçın, assistant professor at Eskisehir Technical University, Turkey, was a postdoc at Lehigh ISE from June 2021 to June 2022 under the supervision of Prof. Frank E. Curtis. Gülçin's research interests include non-smooth non-convex optimization and vehicle routing problems.



Albert Berahas, assistant professor at the University of Michigan, was a postdoc at Lehigh ISE from September 2018 to August 2020 under the supervision of Prof. Katya Scheinberg, Prof. Frank E. Curtis, and Prof. Martin Takáč. Albert's research interests focus on developing algorithms for solving large-scale nonlinear optimization problems.



Mengqi Hu, currently a postdoc at the University of North Carolina at Chapel Hill, was previously a postdoc at Lehigh ISE from February 2022 to July 2023 under the supervision of Prof. Xiu Yang. Mengqi's research interests focus on uncertainty quantification.

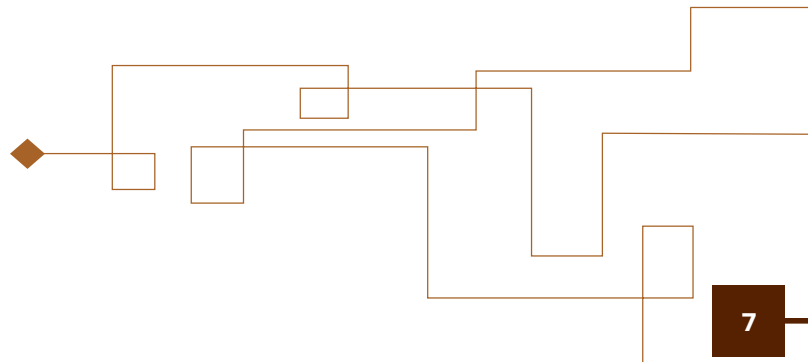


Mike O'Neill, assistant professor at the University of North Carolina at Chapel Hill, was a postdoc at Lehigh ISE from 2020 to 2022 under the supervision of Prof. Frank E. Curtis and Prof. Daniel P. Robinson. Mike's research interests lie in the design, analysis, and implementation of continuous, nonlinear optimization methods.



We conclude with **Ka Wa Yip**, currently a postdoc at Zhejiang Lab in China, who was affiliated with the Quantum Computing and Optimization Lab at Lehigh ISE from July to September 2021.

We look forward with enthusiasm to the continued impact of our postdocs in driving innovation, inspiring the next generation, and elevating our academic community to even greater heights.



ISE FACULTY

news



LARRY SNYDER

Lehigh ISE faculty Larry Snyder has been elected a Fellow of IISE

Lehigh ISE Professor **Lawrence V. Snyder** has been elected as a Fellow of the Institute of Industrial & Systems Engineers (IISE). This honor is reserved for a few distinguished members of IISE. The newly selected Fellows were recognized during the 2024 IISE Annual Conference & Expo, held in Montreal, Canada, May 18-21.

The **IISE Fellow Award** recognizes outstanding leaders of the profession who have made significant, nationally recognized contributions to industrial and systems engineering. A Fellow is the highest classification of IISE membership.

Larry Snyder is an established leader in the field of operations research and systems engineering, with a vast and highly cited publication record. He received his PhD from Northwestern University in 2003 with a dissertation on robustness and reliability of supply chains. Since that time, he has greatly expanded his research portfolio to include work on logistics, transportation theory, facility location, inventory models, energy systems, decision-making under uncertainty, and machine and reinforcement learning. He has a strong record of interdisciplinary research excellence, spanning his entire career over 20 years at Lehigh, where he has also been a stellar educator, highly appreciated by his students. He served as Co-Director and Director of Lehigh's Institute for Data, Intelligent Systems, and Computation (I-DISC) during 2019-2023. He currently serves as Lehigh's Deputy Provost for Faculty Affairs.

"It is a great honor to be elected a Fellow of a society I have always admired and respected. Throughout my career IISE has been there and has helped guide me through all the stages of career development. This recognition means a lot." says Larry Snyder.



Creating a New York Times-Worthy Crossword Puzzle

Larry Snyder, Lehigh ISE faculty and deputy provost for faculty affairs, constructed a crossword puzzle that made the pages of the venerable publication last month.

Larry Snyder is a cruciverbalist. And if you enjoy solving—or creating—crossword puzzles, you are, too.

People have enjoyed solving crossword puzzles for more than 100 years, and those that solved The New York Times crossword on Friday, Feb. 23, worked on a puzzle designed and submitted by Snyder, deputy provost for faculty affairs and the Harvey E. Wagner Endowed Chair Professor in the P.C. Rossin College of Engineering and Applied Science.

“Industrial and systems engineering is a field that uses a lot of math and computing, and in many ways feels like solving puzzles,” said Snyder. “It’s gratifying to use that same part of my brain to create actual puzzles. Getting one published in the Times is a huge thrill.”

The New York Times operates under an open submission policy, which means anyone can submit puzzles for consideration. According to the New York Times, the publication receives approximately 150 to 200 puzzle submissions weekly. Considering it prints seven per week, the odds of being published are low.

Snyder has been solving crossword puzzles sporadically for years, a hobby that became more regular during the idle days of the pandemic. In The New York Times, daily crossword puzzles are more challenging as the week progresses; during his early puzzle-solving days, Snyder doubted he could complete its Monday puzzle. Yet as he practiced, his skill became stronger, and he now solves its puzzles daily, in addition to others, when time permits.

In late 2022, he decided to move beyond solving and began constructing crossword puzzles. He admitted his first few puzzles were not his best work.

“I collaborated with more experienced puzzle constructors,” Snyder said, “and learned a lot from the Discord server Crosscord.”

Snyder first decides whether he is constructing a themed or themeless puzzle (Sunday through Thursday New York Times’ puzzles are themed; Friday and Saturday are unthemed, and the most difficult puzzles of the week).

He says regardless of the puzzle type, the process almost always follows the same steps: theme entries (if any), grid, fill, clues.

Once he has an idea for a themed puzzle, Snyder chooses entries. That step involves quite a bit of brainstorming. He

then builds a grid, adds theme entries, and adds the “fill” (non-themed entries). Snyder said there is software to do this, but it is designed to assist, not build the puzzle. After he constructs a filled grid, the final step is writing clues.

“The constructor makes choices about what words to use, and that’s one way the constructor’s ‘voice’ comes through,” Snyder said.

He often writes Python code to help with brainstorming themed puzzles.

“For example, the theme of one of my puzzles was ‘phrases whose words can come after DATE or TIME,’” Snyder said. “The revealer was DATE AND TIME, and the theme entries were phrases like PROM NIGHT (because PROM DATE and NIGHT TIME) and HOT SPRING (HOT DATE and SPRING TIME). I wrote Python code to find entries that would fit this pattern.”

He approaches themeless puzzles differently, focusing on “longer, more sparkly entries—fun or new or otherwise interesting words or phrases.”

The first step is building a grid with spaces for long answers, followed by searching for interesting entries that intersect with the rest of the puzzle.

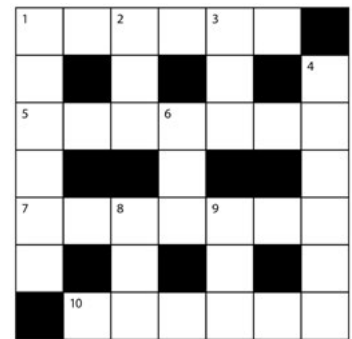
“I try to avoid ‘crosswordese’—words like EPEE and AGLET that appear a lot in crosswords but not in everyday life,” Snyder said.

Once he is happy with the filled grid, he writes the clues.

Although this is his first New York Times puzzle, Snyder is no stranger to having his crosswords appear in major publications. His puzzles have been published in the Los Angeles Times, Universal Crossword (which publishes puzzles in The Philadelphia Inquirer, The Boston Globe, Miami Herald, and other major newspapers), and there is one scheduled for publication in USA Today. His puzzles have also appeared in subscription-based services AVCX and Modern Crossword. For the last year or so, he has also created crosswords for his father’s retirement community’s monthly newsletter.

“I think crosswords—both solving and constructing—help you think in flexible ways,” Snyder said. “Focusing on a crossword is a great way to calm a busy mind.”

Puzzled by crosswords? Snyder recommends this article for starting your crossword-solving journey.



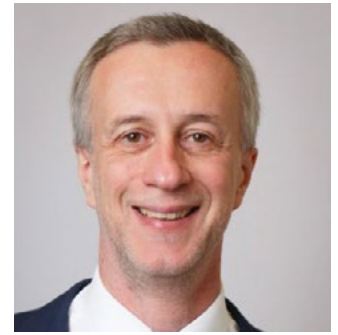
Lehigh ISE faculty Luis Nunes Vicente has been selected as a Fellow of SIAM

Lehigh ISE Timothy J. Wilmott Endowed Chair Professor and Chair **Luis Nunes Vicente** has been selected as a Fellow of the Society for Industrial and Applied Mathematics (SIAM). **SIAM** has over 14,000 individual members in all areas of industrial and applied math. The 26 newly selected Fellows will be recognized during the 2024 SIAM Annual Meeting in Spokane, Washington, USA, July 18-20.

The **SIAM Fellows Program** recognizes members of SIAM who have made outstanding contributions to fields served by the industrial and applied math community. According to his citation, Luis was selected for ground-breaking contributions to derivative-free and bilevel optimization, and exemplary leadership in editorial and organizational service to the SIAM community.

Luis Nunes Vicente is a well-known researcher in the field of continuous optimization and its applications to industrial engineering and operations research. He obtained his PhD from Rice University in 1996 under a Fulbright scholarship. In 2015, he was awarded the Lagrange Prize of MOS-SIAM. He held visiting positions at IBM Research, NYU, Rice, CERFACS, and Rome Sapienza. He has served on numerous editorial boards, including SIAM Journal on Optimization and Mathematical Programming. Recently, he was elected chair of the SIAM Activity Group on Optimization for 2023-2025 and chair of ACORD in 2023 (the Association of Chairs of OR Departments at INFORMS). He has been chairing the Lehigh ISE Department since August 2018.

“It is a great honor to be elected a Fellow of SIAM. I have always had tremendous admiration for SIAM, from all the work done to promote the field and the profession to all its journals, conferences, and awards. I never thought I would reach this level, and my takeaway is to continue to work hard in my research and serve others in the community.” says Luis Nunes Vicente.



LUIS NUNES VICENTE

Lehigh ISE Chair elected president of the operations research association of chairs

Lehigh ISE chair was recently elected president of the Association of Chairs of Operations Research Departments (**ACORD**), a forum hosted by the Institute for Operations Research and the Management Sciences (**INFORMS**). **Luis Nunes Vicente**, Timothy J. Wilmott Endowed Chair Professor and Chair of the Department of Industrial and Systems Engineering (ISE) at Lehigh University, was unanimously elected president of ACORD for a 2-year term (2024-2025).

INFORMS is the world’s prime society for researchers and practitioners in the fields of operations research and management science, and it forms the largest professional association for the decision and data sciences. INFORMS grants prestigious prizes and awards for meritorious achievement and publishes several of the best journals in the field.

ACORD’s mission is to encourage interest in the field of operations research and the management sciences, to encourage discussion and interaction among individuals who serve as chairs, directors, and heads of academic programs in the field, and to advise the INFORMS on aspects of the academic environment for operations research and the management sciences.

“It is a great honor and responsibility to lead ACORD during the next two years. In the US, operations research sits mostly in departments of industrial engineering as well as in business schools, and my greatest challenge is to bring these two communities closer. ACORD has around 50 active members but there are another 50 OR programs in the business schools that would fit well.” says Luis Nunes Vicente.

ISE FACULTY

news



TAMÁS TERLAKY

Lehigh ISE Professor Tamás Terlaky delivers prestigious lectures in Asia and US

It is our great pleasure to report that Lehigh ISE George N. and Soteria Kledaras '87 Endowed Chair Professor **Tamás Terlaky** is delivering talks in Asia and the US, in the prestigious forms of plenary lectures at conferences and academic distinguished endowed lectures.



Professor **Tamás Terlaky** was the *Guest of Honor and Invited Opening Plenary Speaker at the G-20 Themed International Conference on Variational Analysis and Optimization with Applications (ICVAOA-2023)*. The **conference** took place at Aligarh Muslim University (AMU), one of the oldest and most prestigious universities of India, and attracted participants from all over the world. Professor Terlaky delivered the opening plenary lecture on quantum computing optimization and was recognized with AMU's Life Time Research Excellence Award.

Recently, Professor **Tamás Terlaky** also delivered a virtual plenary lecture at the **9th International Conference on Industrial and Systems Engineering**. Professor Terlaky's presentation, titled "The Quantum Computing Revolution: Optimization Challenges, Trends, and Perspectives", shed light on the exciting advancements in the field of quantum computing optimization, and its potentially transformative impact on the field of industrial and systems engineering.



Last but not the least, Professor **Tamás Terlaky** was invited to deliver the Spring 2024 Class of '27 endowed lecture at the Department of Mathematical Sciences at Rensselaer Polytechnic Institute (RPI). The prestigious **Class of '27 Lecture Series** is analogous to the Lehigh ISE's Spencer C. Shantz Distinguished Lecture Series. Notably, RPI has acquired an IBM-Q Quantum Computer, and is making significant investment in the quantum computing area. Terlaky's invitation to deliver a public and technical lecture focusing on "advances, challenges and research opportunities on the area of quantum computing optimization" is also a recognition of the quality of research, high level of activities and ever-growing visibility of the ISE Department's Quantum Computing Optimization Laboratory (**QCOL**).

In the words of **Dr. Terlaky** "I am most grateful for the support of our department, and the opportunities Lehigh provided to me. I am also indebted to all members of the QCOL for helping to bring the ISE Department and Lehigh in the center of the world of quantum computing optimization. They share the high recognitions coming with prestigious lecture invitations and scientific society service recognitions."

Terlaky named to Alcoa Foundation Professorship

Tamás Terlaky has been appointed as the Alcoa Foundation Professor of Industrial and Systems Engineering, effective January 1, 2024, in recognition of his accomplishments and contributions to the Lehigh Engineering community.

Established in the 1960s by the Alcoa Foundation, this professorship was founded in honor of Joseph W. Richards (Class of 1886), who earned the first PhD granted by Lehigh and later joined the university faculty.

Terlaky joined the Lehigh faculty in 2008 and served as chair of the ISE department until 2017. He is a director of Lehigh's **Quantum Computing and Optimization Lab**, providing fundamental expertise in interior-point methods, quantum computing optimization, perceptron-like algorithms, and high-performance computational optimization algorithms.

Terlaky's research interests include high-performance optimization methods, optimization models, algorithms and software, and solving optimization problems in engineering sciences.

His research in high-performance computing includes imaging of cancerous tumors and how to radiate the tumor in the most effective way. Terlaky harnesses algorithms to optimize core refueling of nuclear reactors, the radiation effectiveness in cancer treatment, the maintenance scheduling of oil refineries, and more.

He is founding editor-in-chief of Optimization and Engineering and serves as associate editor of seven journals. He is a Fellow of the Fields Institute (Toronto), INFORMS, SIAM, IFORRS, and the Canadian Academy of Engineering and has received numerous honors including the H. Wagner Prize (INFORMS), the Outstanding Innovation in Service Systems Engineering (IISE), and the Award of Merit of the Canadian Operational Research Society. Terlaky serves as editor-in-chief of the Journal of Optimization Theory and Applications, and recently served as vice president of INFORMS and chair of the SIAM Activity Group on Optimization.

SPENCER C. SCHANTZ

lecture series



ROBERT M. FREUND

Lehigh ISE is pleased to announce Robert M. Freund, MIT Sloan School of Management, gave a Spencer C. Schantz Technical Talk

The Lehigh ISE Department was honored to have Robert M. Freund, Theresa Seley Professor in Management Science and a Professor of Operations Research at the MIT Sloan School of Management give a **Spencer C. Schantz Technical Talk** titled **Level-Set Geometry and the Performance of Restarted-PDHG for Conic LP** on Thursday, April 11, 2024, from 11:00 a.m. – 12:00 p.m. in Mohler Laboratory room 453, 200 West Packer Avenue, Bethlehem, PA.

A **luncheon** welcoming Prof. Freund and celebrating the **graduation of the Lehigh ISE UG and Master's students** (May and August of 2024) was served for faculty and students on the same day, Thursday, April 11, 2024, at Zoellner Arts Center, Butz Lobby (2nd Floor), 420 E. Packer Avenue, Bethlehem, PA 18015 from 12:15 p.m. to 1:45 p.m.

The luncheon honored Professor Freund and offered students an opportunity to mingle with classmates and faculty, and proudly acknowledge the culmination of their academic journey before they embark on the next exciting chapter of life.

Please read below to learn more about Professor Freund's lecture and outstanding career.

Abstract: We discuss our recent research aimed at solving truly huge-scale convex optimization problems, at the scale where matrix-factorization-free methods are attractive/necessary. The restarted primal-dual hybrid gradient method (rPDHG) – with heuristic enhancements and GPU implementation – has been very successful in solving huge-scale linear programming (LP) problems; however, its application to more general convex conic optimization problems is not so well-studied. We analyze the theoretical and practical performance of rPDHG for general (convex) conic optimization – with LP as a special case. We show a relationship between the geometry of the primal-dual (sub-) level sets W_e and the convergence rate of rPDHG. Specifically, we prove a bound on the convergence rate of rPDHG that improves when there is a primal-dual sublevel set W_e for which (i) W_e is close (in Hausdorff distance) to the optimal solution set, and (ii) the ratio of its diameter to its “conic radius” is small. In the special case of LP problems, the performance of rPDHG is bounded only by this ratio applied to the sublevel set corresponding to the second-best extreme point.

We note that in practice this ratio can take on extreme values and, in such cases, result in poor performance of the rPDHG both in theory and in practice. To address this issue, we show how central-path-based linear transformations – including conic rescaling – can markedly enhance the convergence rate of rPDHG. We also present computational results that demonstrate how such rescalings can accelerate convergence to high-accuracy solutions, and lead to more efficient methods for huge-scale linear and conic optimization problems. This is joint work with Zikai Xiong.

Bio: Robert Freund is the Theresa Seley Professor in Management Science and a Professor of Operations Research at the MIT Sloan School of Management.

His main research interests are in convex optimization, computational complexity and related computational science, convex geometry, large-scale nonlinear optimization, and related mathematical systems. His more recent work is in first-order methods and their connections to statistical and machine learning. He has served as co-editor of the journal *Mathematical Programming* and associate editor of several optimization and operations research journals. He is the former Co-Director of MIT Operations Research Center, the MIT Program in Computation for Design and Optimization, and the former Chair of the INFORMS Optimization Section. He also served a term as Deputy Dean of the Sloan School at MIT (2008-11).

Freund received the Longuet-Higgins Prize in computer vision (2007) as well as numerous teaching and education awards at MIT in conjunction with the course and textbook (coauthored with Dimitris Bertsimas) *Data, Models, and Decisions: The Fundamentals of Management Science*.

Lehigh ISE Spencer C. Schantz Distinguished Lecture Series:

The lecture series is endowed in the name of the late Spencer C. Schantz, who graduated from Lehigh in 1955 with a B.S. in Industrial Engineering. Following progressive responsibilities with several electrical manufacturing companies, in 1969 he founded U.S. Controls Corporation and became its first CEO and President. The Spencer C. Schantz Distinguished Lecture Series was established by his wife Jerelyn as a valuable educational experience for faculty, students and friends of Lehigh's Industrial and Systems Engineering department.

SPENCER C. SCHANTZ

lecture series



CHRISTINE BURKE

Lehigh ISE is pleased to announce Christine Burke, Executive Director, Morgan Stanley, gave a Spencer C. Schantz Distinguished Public Lecture

The Lehigh ISE Department was honored to have **Christine Burke**, give a **Spencer C. Schantz Distinguished Public Lecture** titled “Resilience, the Art of Surviving and Thriving” on Thursday, May 2, 2023, from 4:15 p.m. to 5:00 p.m. in Mohler Laboratory room 355, 200 West Packer Avenue, Bethlehem, PA.

The **Lehigh ISE Award Ceremony** honoring ISE students, faculty, and staff followed immediately after the lecture (5:00 p.m. to 5:45 p.m.).

The evening concluded with the **Lehigh ISE Banquet Dinner** held at Zoellner Arts Center, Butz Lobby (2nd Floor) 420 East Packer Avenue, Bethlehem, PA 18015 from 6:15 p.m. to 8:45 p.m.

Please read below to learn more about Christine’s lecture and distinguished career.

Abstract: The imperative to ensure personal and organizational resilience has never been greater and will grow with an urgency matching the accelerating pace of change in nearly every facet of our lives. Businesses fend off many thousands of cyber-attacks alone every day. The truth about our collective and individual vulnerabilities is well beyond the data heists, outages and ransomware revealed in daily newsfeeds. We know being compromised is a ‘when’ not an ‘if’. Are you ready? Relentless exposure to media in overdrive, positive and negative, social and otherwise, elicits a persistent stress response. How does that feel? As symbiotic denizens of a shared planet the climate crisis impacts us personally and collectively, directly and ever closer to our periphery. Are you ready? Increasing interconnectivity makes us stronger and more at risk. So, what do we do? As it turns out, solutions for personal and group resilience are not dissimilar. We are each a microcosm of our many larger wholes, and much can be learned from viewing varied perspectives. Over the course of my career as global change agent, COO, Talent Management Officer, entrepreneur, teacher and now resiliency leader I have seen how critical well-developed resilience is to well-being for individuals, teams, and organizations. Having led the

implementation of programs and practices significantly improving resiliency postures, I know there are levers we can pull that are at once simple, systemic, effective...many squarely from the ISE space. In this session we will talk about what resilience means in its many contexts and discuss tools you can employ to prepare for the constant of change we live in and to help organizations and individuals you care about to not just survive but to thrive.

Bio: Christine Burke is an Executive Director at Morgan Stanley where she has been a global change leader, Talent Management Officer (twice), Chief Operations Officer (three times), Chief of Staff, internal entrepreneur and is currently a resilience governance leader. She has held leadership positions across the firm in Operations, Technology, Cyber Security and Trading. She is also on the Morgan Stanley Technology Philanthropy Steering Committee having originated the MS cyber-philanthropy initiative. Christine has also been a math teacher in the Bronx, the founding Director of Finance, Operations, Technology and HR in a foundational diverse by design charter school network and is the owner of a global brand unrelated to any of the above. In her time at Morgan Stanley, and prior to that with Coopers & Lybrand Consulting, Christine has worked and, in some cases, lived in over 10 countries. In addition to being a triathlete and having summited Mt. Kilimanjaro, Christine has served on the board of Brooklyn Prospect Charter School and as Co-Chair for Partnership for Children and is a member of the Lehigh ISE Alumni Advisory Council.

Lehigh ISE Spencer C. Schantz Distinguished Lecture Series:

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ISE Seminar Series

Our ISE Seminar Series invites speakers from all over the world to talk about their latest research and engage faculty and students in vibrant discussions on a variety of ISE topics.

SPRING 2024

APRIL 30, 2024

Mateo Diaz, Johns Hopkins University

"Clustering a Mixture of Gaussians with Unknown Covariance"

APRIL 16, 2024

Wiejun Xie, Georgia Tech

"Distributionally Fair Stochastic Optimization Using Wasserstein Distance"

APRIL 9, 2024

Rebekah Ann Herrman, University Of Tennessee, Knoxville

"Combinatorics Techniques in Variational Quantum Algorithms"

MARCH 26, 2024

Inform Student Chapter Distinguished Speaker Series: Mark E. Lewis, Cornell University

"A Stochastic Model for When to Invoke Telemedicine Visits in a Minute Clinic"

MARCH 19, 2024

Lu Lu, Yale University

"Accurate, Efficient, and Reliable Learning of Deep Neural Operators for Multiphysics and Multiscale Problems"

FEBRUARY 27, 2024

David E. Bernal Neira, Purdue University

"Discrete Nonlinear Optimization: Modeling and Solutions Via Novel Hardware and Decomposition Algorithms"

FEBRUARY 20, 2024

Alberto Del Pia, University Of Wisconsin-Madison

"Minimizing Quadratics Over Integers"

FEBRUARY 8, 2024

Osman Ozaltin, North Carolina State University

"Knowledge Discovery in EhRs: Septic Shock Prediction Through Temporal Pattern Mining"

FEBRUARY 6, 2024

Liyan Xie, The Chinese University Of Hong Kong, Shenzhen

"Navigating Online Data: Bridging Efficiency and Robustness in Change Monitoring"

JANUARY 30, 2024

Edgar Solomonik, University Of Illinois At Urbana-Champaign

"Optimization Methods for Tensor Decomposition"

FALL 2023

NOVEMBER 28, 2023

Phebe Vayanos, University Of Southern California

"Learning Optimal and Fair Policies for Allocating Scarce Housing Resources to People Experiencing Homelessness"

NOVEMBER 14, 2023

Sara Shashaani, North Carolina State University

"Adaptive Sampling With Trust-Region Methods for Simulation"

NOVEMBER 7, 2023

Kaizheng Wang, University Of Columbia

"A Stability Principle for Learning Under Non-Stationarity"

OCTOBER 31, 2023

Marcos Medeiros Raimundo, Institute Of Computing At The University Of Campinas

"Coping With Heterogeneity and Privacy in Communication-Efficient Nonconvex Federated Optimization"

OCTOBER 24, 2023

Tianyi Chen, Rensselaer Polytechnic Institute (Rpi)

"On Computational and Statistical Challenges of Learning With Multiple Objectives"

SEPTEMBER 26, 2023

Dong An, University Of Maryland

"Quantum Algorithms for Linear Differential Equations Beyond Hamiltonian Simulation"

SEPTEMBER 19, 2023

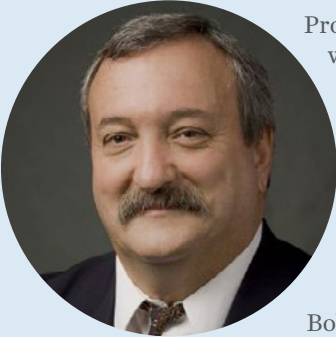
Bao Wang, University Of Utah

"Implicit Methods for Deep Learning on Graphs"

2024 Rossin Awards

On Thursday, May 2, 2024, the Lehigh Industrial and Systems Engineering (ISE) Department held its annual Awards Ceremony in Mohler Laboratory. It was our pleasure to announce and celebrate the achievements of our students, alumni, staff, and faculty. The first award below was given by the Rossin College of Engineering and Applied Science on May 6th.

2024 Rossin Citizenship Award



Professor **Robert H. Storer** has won the 2024 Rossin Citizenship Award. This award recognizes a Rossin college faculty member who has demonstrated outstanding citizenship to Lehigh University, the Rossin College, and their own Department/Unit.

Bob has been a faculty member for 38 years. Throughout his career Bob has served the Department, College, and University with dedication, and selflessness. He has given the highest priority to the best interests of our students, advising over 100 students every year. Some of his notable accomplishments include being Co-Director of the Integrated Business and Engineering (IBE) Honor's Program for 24 years and Co-Developer of the Financial Engineering Master's Program. Bob is a champion of service at Lehigh, having served on a multitude of committees. Bob managed to do all this while being a devoted teacher and great researcher. **Congratulations Bob!**

2024 ISE Distinguished Alumni Award



Christine Burke, Executive Director at Morgan Stanley is the recipient of the 2024 Lehigh ISE Distinguished Alumni Award for Excellence in Industry. Christine Burke is an Executive Director at Morgan Stanley where she is currently a Resilience governance leader, after holding leadership positions in Operations, Technology, Cyber Security and Trading Christine

engages in a multiplicity of work-related activities, from steering cyber-philanthropy and delivering math classes to promoting diversity and inclusion in K-12 schools. We are very proud to have Christine as a member of our ISE Advisory Council where we are inspired by her talent, dedication, and commitment. **Congratulations Christine!**





LAUREN SCHULTZ

2024 Lawrence E. White Fellowship

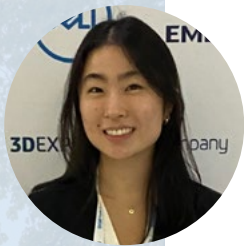
Lauren Schultz is the recipient of the **2024 Lawrence E. White Fellowship** for a Master's in Management Science and Engineering. This fellowship is made available through the generosity of Lehigh ISE alumnus Lawrence E. White ('64, '65, '69) for a full tuition towards 30 credits of master's degree study. Lauren is an ISE major interested in the fields of supply chain management and data analytics. She is an active member of the Lehigh Department of Theater. Congratulations Lauren!



THAKSHEEL N. ALLECK

2024 Van Hoesen Family Best Publication Award

Thaksheel N. Alleck is the recipient of the eighth annual **Van Hoesen Family Best Publication Award**. This award inspires students to publish influential research, software tools, and applications, and was made available through a generous gift of Everett Van Hoesen '55. Thaksheel will receive a \$1,250 monetary prize for his paper "Why is Soccer so Popular: Understanding Underdog Achievement and Randomness in Team Ball Sports", co-authored with Professors Luis Nunes Vicente and Tommaso Giovannelli and Undergraduate Students Roman Mitchell and Ori Remen. Thaksheel is a junior IBE undergraduate pursuing a double major in ISE and Marketing (with a minor in Data Science). Congratulations Thaksheel!



MIKI SAKAI

2024 ISE Community and Culture Award

The ISE Community & Culture Award recognizes members of the ISE Community who actively cultivate a strong connected community within the ISE department and beyond. Deserving nominees bring people together, create meaningful engagement opportunities, and inspire a culture of support and shared purpose. Through their efforts--such as mentoring, organizing initiatives that enhance connection, and championing a welcoming environment--they help shape a vibrant and engaged academic community. Our 2024 awardees are:

Miki Sakai is a junior undergraduate student pursuing a degree in ISE with minors in Business and Data Science. Miki co-leads the outreach subcommittee within the Lehigh's Society for Women in Engineering (SWE), where she has expanded the offering of programs conducted by SWE with middle-schoolers by developing and running multiple successful and engaging engineering and science-related after-school programs at Broughal Middle School. Congratulations Miki!



KARME S. SHEHADEH

Professor **Karmel S. Shehadeh** is an Assistant Professor at Lehigh ISE. Karmel has been a champion for the undergraduate research projects in the Lehigh ISE Outreach Program by serving as advisor of five teams with underrepresented students on projects for this program. Karmel has also, since 2020, served as presenter and faculty mentor for members of Lehigh CHOICES attending Spring and Summer Camps for middle school girls. Congratulations Karmel!



GRACE KOLBE

2024 MIT Supply Chain Excellence Award

Each year MIT presents its Supply Chain Excellence Award to outstanding graduating seniors from Lehigh. The awards recognize students' potential for leadership in supply chain management and provide tuition scholarships for the MIT Supply Chain Management Master's Program after a minimum of two years' work experience in the supply chain sector. Winners were selected based on personal statements and on their academic excellence at Lehigh.

Grace Kolbe is the recipient of the 2024 MIT Supply Chain Excellence Award. Grace is a senior studying ISE with minors in Engineering Leadership and Supply Chain Management. Grace is a member of the Lehigh Women's Cross Country and Track and Field teams and will graduate with the highest honors. After graduation, Grace will join Becton Dickinson in their Global Procurement Development Program. Congratulations Grace!



2024 Lehigh ISE Student and Faculty of the Year Awards

Lehigh ISE is honored to announce the following awards in recognition and appreciation of students and faculty, for their achievements throughout the 2023-2024 academic year. The department congratulates these students and faculty and thanks them for their contributions and dedication to the ISE Department.

Industrial and Systems Engineering Sophomore of the Year: **Olivia Newman**

IBE Industrial and Systems Engineering Sophomore of the Year: **Ruhi Tawde**

IBE Financial Engineering Sophomore of the Year: **Darin Gulibon**

Industrial and Systems Engineering Junior of the Year: **Melissa Caracciolo**

IBE Industrial and Systems Engineering Junior of the Year: **Thaksheel N. Alleck**

IBE Financial Engineering Junior of the Year: **Michael Jamesley**

Industrial and Systems Engineering Senior of the Year: **Brooke Cannon**

IBE Industrial and Systems Engineering Senior of the Year: **Owen Brown**

IBE Financial Engineering Senior of the Year: **Kellia Nguyen**

Industrial and Systems Engineering Master's Student of the Year: **Hiral Patel**

Management Science and Engineering Master's Student of the Year: **Josie Charles**

Healthcare Systems Engineering Master's Student of the Year: **Amanda Curry and Pilar Klin**

Financial Engineering Master's Student of the Year: **Gregory Colonescu**

ISE Ph.D. Student of the Year: **Griffin Kent and Qi Wang**

Staff Member of the Biennium: **Sheila Dorney and Mark Motsko**

Undergraduate Faculty Member of the Year: **Professor Gregory L. Tonkay**

Master's Faculty Member of the Year: **Professor Ana I. Alexandrescu**

Ph.D. Faculty Member of the Year: **Professor Daniel P. Robinson**

DEGREES AWARDED SPRING 2024

PH.D. ENGINEERING INDUSTRIAL AND SYSTEMS ENGINEERING

- Muqing Zheng

M.ENG. HEALTHCARE SYSTEMS ENGINEERING

- Sara Elias
- John Perri
- Pilar Klin
- Natapol Phetsuk

M.ENG. INDUSTRIAL AND SYSTEMS ENGINEERING

- Aishwrya Dandgawhal
- Hiral Patel

M.ENG. MANAGEMENT SCIENCE AND ENGINEERING

- Bo Zhang

M.S. FINANCIAL ENGINEERING

- Zicheng Huang
- Samuel Mandelbraut
- Joao Ji Won Lee
- Haiwen Su
- Wasti Khan
- Asim Turk
- Noah Levine
- Jingwen Yu
- Edris Loftpouri
- Julia Zhu

M.ENG. INDUSTRIAL AND SYSTEMS ENGINEERING

- Abdulkarim Zahhar

B.S. INTEGRATED BUSINESS AND ENGINEERING HONORS PROGRAM (ISE MAJOR)

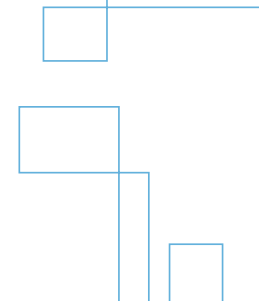
- Dean Bleiler
- Jude Ferri
- Wil Carpenter
- Dan Graney
- Patrick Daly
- Sebastian Wick

B.S. INTEGRATED BUSINESS AND ENGINEERING HONORS PROGRAM (FINANCIAL ENGINEERING MAJOR)

- Leigh McDermott
- Kellia Nguyen
- David Missry
- Chris Toh

B.S. INDUSTRIAL AND SYSTEMS ENGINEERING

- Rana Akyildiz
- Roman Mitchell
- Humza Bengali
- Alex Odle
- Owen Brown
- George Padezanin
- Riley Burke
- Jordan Paul
- Brooke Cannon
- Christiana Pinette
- Keith Cheung
- Radhika Rawal
- Olivia Cuff
- Ori Remen
- Chris Dorrer
- Olivia Romano
- Robert Erickson
- Brent Rosendorf
- Alex Fernandez
- Oren Roznitsky
- Jude Ferri
- Claire Samson
- Lauren Fountain
- Lauren Schultz
- Mike Grise
- Justin Sweet
- Meghna Grover
- Justin Tan
- Brenna Hastings
- Alex Wallace
- Colby Jones
- Hannah Wind
- Grace Kolbe
- Zhengyang Wu
- Cam Lynch
- Kevin Yang
- David Missry



ISE STUDENT NEWS

Applying systems thinking to the challenges of sustainable tourism

As a Fulbright scholar, Lehigh ISE major and student-athlete Brooke Cannon '24 will pursue grad studies in Greece, combining her engineering skills and mindset with her passion for preserving wildlife and the environment.



Brooke Cannon's path to landing a Fulbright scholarship started, in part, with a baby deer named Juicy.

The fawn's mother had been hit by a car, and the newborn lay on the side of the road, covered with insects.

"My dad saw it and brought it home, and we fed it goat milk and basically tried to do everything for her that her mother would have done," says Cannon, a senior majoring in industrial and systems engineering (ISE). "And when she was old enough, we were able to release her into the **Back Bay Wildlife Refuge**, which is less than a mile from my house, and where she was able to lead a normal deer life."

The experience of raising and releasing Juicy so close to her home in Virginia Beach played a big role in Cannon's application to the **Fulbright U.S. Student Program**, one of the best-known and prestigious scholarships in the world. The program provides opportunities for learning, research, or teaching English abroad in more than 140 countries. Cannon applied to study for a Master of Science in Sustainable Tourism Development, Cultural Heritage, Environment, and Society at **Harokopio University** in Athens, Greece.

"I have so many good memories of hiking, camping, and doing cleanups in the refuge, and I loved that we were able to release Juicy into this wild, safe place to roam around," says Cannon. "But there's a lot of controversy between developers, homeowners, and the wildlife refuge over the land right now. When I saw the sustainable tourism program in Greece, I immediately thought it would give me the skills I need to go back to my hometown and help solve some of these problems."

It's a program and a path that a year ago, Cannon never could have foreseen taking. But as a junior, she attended a seminar offered by **Outreach ISE**, a program designed to raise undergraduates' awareness of opportunities in industrial and systems engineering. On that particular day, Jennifer Marangos, an advisor in the **Office of Fellowship Advising**, was giving a presentation on the different international scholarships and fellowships available to undergraduate students.

"At the time, I had no idea what I wanted to do after graduation, and I'm so glad I went to that seminar," says Cannon, who is also a student-athlete—a center fielder on the **Lehigh softball team**. "The more I learned about the Fulbright, like the fact that I could choose where I wanted to study, the more it appealed to me. I was able to make a personal connection with Jennifer that same day, and she ended up being my advisor throughout the process."

Cannon initially met with Marangos and with several of her professors to help her determine where in the world she wanted to go and what she wanted to study. She eventually landed on Greece—for its sustainable tourism program, its own successes and struggles to accommodate mass tourism, its beauty, and its proximity to the rest of Europe.

One challenge, however, was to make the connection between her ISE major and tourism. For that, she turned to **Ana Alexandrescu**, a professor of practice who directs both the Healthcare Systems Engineering Program and the Lehigh ISE Outreach Program.

"She helped me see that the systematic problem-solving we use in ISE can be used to address issues around tourism. Yes, it's a different kind of problem with different constraints, but the approach to solving it can be similar."

It was in those meetings that Cannon also tapped into her deep love and concern for the Back Bay Wildlife Refuge, and what it means to the people and creatures around her community. Once she made the connection between that and the skills she'd honed over the past four years as an ISE student, it all came together. "I found the problem that I was passionate about solving, and I realized I had a unique skill set that could help me solve it. And that's how Juicy became such a big part of my application."

The essay, however, is just one part of a rigorous application process that demands academic excellence, integrity, and initiative. Cannon has made the Dean's List every semester while at Lehigh, and has received numerous honors such as the Industrial and Systems Engineering Sophomore of the Year (and most recently, Senior of the Year). She was chosen along with a classmate to attend the IISE Annual Conference in New Orleans and attend a symposium as a representative of Lehigh ISE. She also serves as the President for the IISE Student Chapter 864.

"There's also an ambassadorial element to the Fulbright award," says Marangos. "Those reviewing the applications are looking for evidence that the candidate they select will be a strong representative of the United States at their host institution and in their host country. This is where Brooke's soft skills elevated her as an applicant. She radiates openness and positivity in a way that makes her easily approachable."

After deciding to apply for a Fulbright in Greece, Cannon did everything she could to learn more about her potential host country, says Marangos. She connected over LinkedIn with a Greek scholar who had graduated from the same program, read his research publications, and initiated discussions about those papers with him over email. She started studying Greek by listening to podcasts and movies, and by following the professional Greek softball team's championship season. She even began coordinating with language exchange meetups in Athens that she could join.

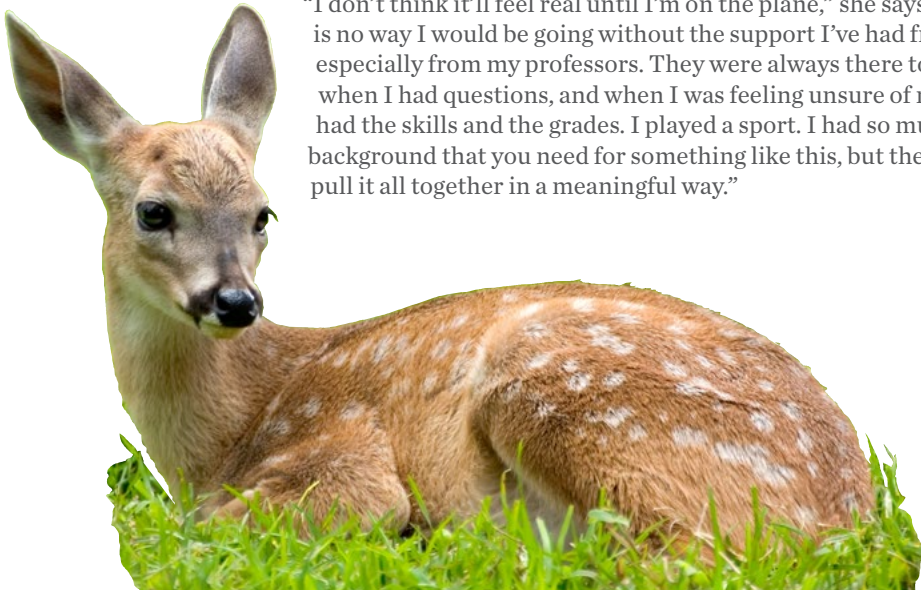
"Learning about the program and country you're targeting is also part of the application process," says Marangos. "And Brooke made a serious effort to do that before she even hit send on her application."

The day Cannon got the email from the U.S. Fulbright Program, she waited to open it until she was alone in her room with just her sister on FaceTime.

"I was thinking, This could either be really fun or really not fun," she says about her sister watching over her over the phone. "But when I opened the email and saw that I had been accepted, she got all these screenshots of me with my hands over my face, mouth wide open, crying. She got it all. So that was pretty cool."

Cannon will return home to Virginia Beach after graduation this spring, and will begin the two-semester-long master's program in Greece in October. For now, she is still in a state of disbelief.

"I don't think it'll feel real until I'm on the plane," she says. "And there is no way I would be going without the support I've had from Lehigh, especially from my professors. They were always there to help me when I had questions, and when I was feeling unsure of myself. I had the skills and the grades. I played a sport. I had so much of the background that you need for something like this, but they helped me pull it all together in a meaningful way."



ALUMNI NEWS

Industrial engineering alumna **Margaret Mayer** '93G '95 PhD has been named chief technology officer at Zions Bancorporation, effective Oct. 17, 2023, according to a [press release](#).

In her new role, Mayer will “manage all information technology functions for the organization, including application engineering, technology operations, technology strategy, data engineering, and technology infrastructure,” according to the article.

Most recently, Mayer served as vice president and CTO for the consumer banking technology teams at Discover Financial Services, where she led digital transformation strategy. She also held numerous senior technology roles over a 22-year career at Capital One.

Mayer has served as an advisory board member of the computer science department at Virginia Commonwealth University, and she is a board member, and former board chair, of CodeVA, a nonprofit that ensures students receive computer science education across the state of Virginia.

In addition to her Lehigh ISE graduate degrees, Mayer also holds a bachelor’s in engineering from Cornell University.

Read the full article on Zions Bancorporation’s [website](#).



Integrated Business and Engineering (IBE) alum **Katherine Hardenbergh** '11 has been appointed senior vice president and director of research for quantitative asset management firm Intech, according to a press release.

Hardenbergh, who earned Lehigh bachelor’s degrees in both IBE and Information and Systems Engineering, has over 10 years of experience in financial services, with focus areas including responsible investing, global equity research, and equities electronic trading. She has served in leadership roles at Acadian Asset Management and Bank of America Merrill Lynch.

Hardenbergh also has a master’s degree in mathematics in finance from New York University and was a graduate-level professor at Stevens Institute of Technology, teaching investment management.

In her new role at Intech, Hardenbergh will “develop novel alpha signals, focusing on a broad application across global markets and strategies” according to the article.

Read the [full article](#) on Intech’s website.





Bronze sponsorship of the
Lehigh ISE 100 Program of Events has been provided by:

Karen J. LaRoche '88

David Meadows '98G, '96 and Tricia Wandrie '97

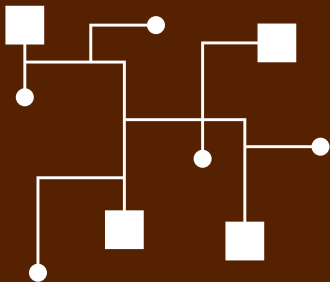


100

LEHIGH ISE IS CELEBRATING 100 YEARS

Please join us in celebrating Lehigh ISE 100!

In the academic year 2024/2025 we will accomplish 100 years of Industrial Engineering at Lehigh.
Yes, we started offering our first undergraduate program in Industrial Engineering a century ago!



LEHIGH
UNIVERSITY

P.C. Rossin College
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Applied Science

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